

Millmate Thickness Gauging systems MTG Box gauge – field test

MTG Box gauge – gapless strip gauging
for aluminium mills

Measurement made easy



Introduction

Already in the 19th century, in the early days of electrical industrialization, the famous German inventor and industrialist Werner von Siemens stated “Messen ist wissen” – to measure is to know! More than a hundred years later this statement is just as relevant. The micro-processor revolution, sophisticated mathematical process models and the development of advanced digital control systems have not changed the fact that sensors are indispensable to industrial process control. But in order to fulfil their tasks, sensors must be placed in the middle of the process and they are often exposed to quite harsh environment. Therefore, sensors are not only essential components in the control system. Affected by severe production environment, they may also be a source of problems and process down-time. So, ever since sensors were introduced in industrial processes, the quest for the perfect sensor has been going on.

For more information

Watch the video about the MTG Box gauge field test at Profilglass SpA, Fano, Italy, by scanning this code:



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MTG Box gauge – field test

The quest for the perfect thickness gauge

Slightly more than 10 years ago, ABB Force Measurement introduced the MTG Standard gauge for strip thickness measurement in cold rolling mills. This gauge is in two specific respects a step towards the perfect sensor compared to older technologies for gauging. It measures the strip thickness independent of alloy properties and it measures without influence from the rolling mill environment. Many rolling mills have installed the MTG Standard gauge and are very happy with a gauge that is close to perfect in these respects. Other mills have hesitated because of a concern about the measuring position and the measuring gap.



New gapless thickness gauge

In order to meet the requirements of hesitating customers we first considered making the measuring gap larger and deeper, but we decided to go for a different solution. After a lot of hard R&D work, it is now time for a gapless gauge – a gauge that measures from one side only. The advantages are obvious to people with knowledge about strip rolling. We believe that this gauge is another step on the way towards the perfect thickness gauge.



Flexible mounting enables center line measurement

The new gauge unit is a small-sized box that is easy to install. We call it the MTG Box gauge. The installation of this gauge makes threading and start of rolling fast and easy, and minimizes the risk of mechanical impact. There is no horizontal movement of the gauge, just a short and quick vertical movement. During threading, the gauge is moved down below the level of the roller table. At start of rolling it is moved up, slightly below the pass-line. The MTG Box gauge can be mounted on the center line of the mill or anywhere across the strip. It is designed for aluminium applications only and the thickness range of the first version is from 8 mm down to 0.5 mm.

MTG Box gauge features

- Single sided measurement
- Small size
- Center line measurement
- Alloy independent
- No influence from mill environment

MTG Box gauge prototypes tested in rolling mills

Early prototypes of the MTG Box gauge have already been tested in two different rolling mills. One prototype system has been running continuously for more than 6 months in a mill at Profilglass in Italy. The results are very positive. During 6 months of operation there has been no maintenance needed and no down-time due to failure in the gauge.

Accurate thickness measurement

The MTG Box gauge prototype is installed close to an existing MTG Standard gauge – a gauge with verified performance since more than 10 years of operation. In order to evaluate the dynamic performance of the MTG Box gauge, we compared the thickness signals during rolling from the two gauges, for various strip thicknesses. The correspondence of the short-time thickness variations between the two gauges is excellent. The graph shows a logger result for 1 mm thick strip.

Comparison between MTG Box Gauge and Standard Gauge NomTh=1000 μm , Resistivity $\approx 41 \text{ n}\Omega\text{m}$, CoilID=4903/124

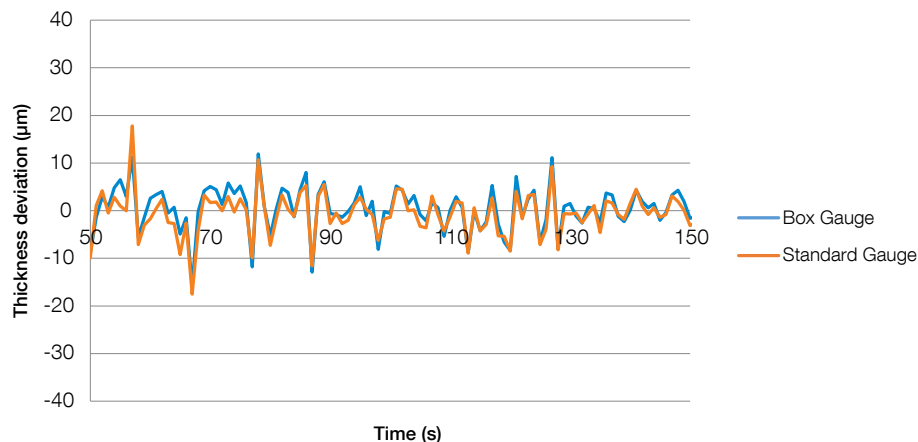


Figure: Dynamic performance - Comparison between the MTG Box gauge and the MTG Standard gauge

Excellent long term stability

We included five reference plates of different thicknesses in the prototype test at Profilglass. These reference plates have been measured repeatedly during a period of 3 months, in order to determine the long term drift. During this time there has been no zero-setting, no calibration or any other adjustment of the gauge. The reference plate measurements were done in the mill, with normal variations in environmental conditions. The MTG Box gauge prototype has shown excellent long term stability with a maximum thickness deviation of less than 0.2 %, during more than 3 months of test without any zero-setting. The conclusion of this stability test is that zero-setting in combination with a limited plate calibration a few times a year, will reduce the gauge drift to an insignificant level.

Experiences from field test

- Accurate measurement
- Excellent long term stability
- Fast and easy to install
- No risk for mechanical impact
- Instant operation – reduced head and tail

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